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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,122	09/06/2001	Thomas Bieringer	MO-6585/LEA 33,633	9409
157	7590	03/19/2004	EXAMINER ANGEBRANNDT, MARTIN J	
BAYER POLYMERS LLC 100 BAYER ROAD PITTSBURGH, PA 15205			ART UNIT 1756	PAPER NUMBER
DATE MAILED: 03/19/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/936,122

Applicant(s)

BIERINGER ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/8/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

1. The response provided by the applicant has been read and given careful consideration.

Rejection of the previous office action not repeated below are withdrawn based upon the amendments to the claims, specifically the thicknesses.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3 Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either** Bieringer et al. '846, Hvilstead et al. '670, Ringsdorf et al., "Electrooptical effects of azo dyes containing liquid crystalline copolymers", Makromol. Chem., Vol 185, pp. 1326-1335 (1984), Eich et al., "Erasable holograms in polymeric liquid crystals", Makromol. Chem., Rapid Commun., Vol 8, pp. 467-471 (1987), Berneth et al. WO 98/51721, Haarer et al. DE 4431823, or Stumpe et al. DE 4339862, in view of Kawano et al. '890 and Colvin et al. '648.

Bieringer et al. '846 discloses azo monomers disclosed in columns 4-6. See the liquid crystalline monomers, which exhibit shape anisotropy in columns 6-7. See also general formulae I and II. The recording of holograms is disclosed. (9/37-41). The formation of films of thicknesses of 0.1 and 1 mm is disclosed. (21-23). The use of copolymers is shown in polymers 4, 6-8, and 10-12 using azo monomer 7. The use of injection techniques is disclosed. (inflow)

Hvilstead et al. '670 in example 3 records a hologram.

Ringsdorf et al., "Electrooptical effects of azo dyes containing liquid crystalline copolymers", Makromol. Chem., Vol 185, pp. 1326-1335 (1984) teaches the copolymers formed on page 1329 and used in the optical cell having a spacing of 12 microns between the plates

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(page 1331, table text) See the similarity between the azo monomer and the monomer on page 13 at line 7.

Eich et al., "Erasable holograms in polymeric liquid crystals", Makromol. Chem., Rapid Commun., Vol 8, pp. 467-471 (1987) teaches the copolymers formed on page 468 and used in the optical cell having a spacing of 10 microns between the plates. See the similarity between the azo monomer and the monomer on page 13 at line 7. The recording of holographic images is disclosed. (page 470)

Berneth et al. WO 98/51721 teaches the copolymers on pages 19-31. These are evaluated when coated 0.9 microns thick on a glass substrate and written upon using an argon ion laser at a laser power of 250 mW (27/9-19). See dye monomer on 21/1 (similar to that at 12/17 of instant specification), dye monomer at 24/17 (similar to that at 11/15 of instant specification), dye monomer at 29/5 (similar to that at 12/17 of instant specification), dye monomer at 30/7 (similar to that at 12/17 of instant specification).

Haarer et al. DE 4431823 teaches an example, which copolymerizes the two monomers on page 6 and coats them to a thickness of 34 microns. A hologram ("holographische gitter", holographic grating) was formed. The second monomer is considered to contain a shape anisotropic grouping.

Stumpe et al. DE 4339862 teaches the polymers of formulae IV - VI on page 12. Note that the polymer of formula IV uses an azo monomer corresponding to that shown on page 13 at line 5 of the instant specification. Examples 13 and 14 coat these in 15 microns thick films (14/1-13).

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Kawano et al. '890 teach azo used in holographic recording media to record polarization sensitive holograms. The use of thicknesses of at least 10 microns is disclosed. There is a preference that they be thicker to store more information, with 1 mm thicknesses able to store as much as 100 DVDs. (8/30-34).

Colvin et al. '648 teaches that as thickness increase so does the diffraction efficiency of the medium and the ability to store more holograms due to facilitating Bragg angle selection (angular multiplexing).

It would have been obvious to one skilled in the art to modify the examples of **either** Bieringer et al. '846, Hvilsted et al. '670, Ringsdorf et al., "Electrooptical effects of azo dyes containing liquid crystalline copolymers", Makromol. Chem., Vol 185, pp. 1326-1335 (1984), Eich et al., "Erasable holograms in polymeric liquid crystals", Makromol. Chem., Rapid Commun., Vol 8, pp. 467-471 (1987), Berneth et al. WO 98/51721, Haarer et al. DE 4431823, or Stumpe et al. DE 4339862 cited by increasing their thickness to at least 1 mm as taught by Kawano et al. '890 and Colvin et al. '648 to increase their potential diffraction efficiency and angularly multiplexing holograms during recording and reading them out to increase the amount of information recorded in the hologram, thereby increasing its utility. Further it would have been obvious to use either angular multiplexing or polarization multiplexing to record several holograms in the same portion of the resultant medium.

The applicant has argued that the absorption transition below 400 nm and the thickness limitation added render the claimed subject matter allowable. The examiner notes that the transition is inherent to benzene/phenyl containing compounds which inherently absorb at approximately 280 nm. The thickness limitation is unusual, but as set forth in the rejection, there

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is ample motivation for increasing the thickness of the holographic medium to increase diffraction efficiency as well as the number of holograms, which may be stored in the medium.

4 Claim 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either** Bieringer et al. '846, Hvilstead et al. '670, Ringsdorf et al., "Electrooptical effects of azo dyes containing liquid crystalline copolymers", Makromol. Chem., Vol 185, pp. 1326-1335 (1984), Eich et al., "Erasable holograms in polymeric liquid crystals", Makromol. Chem., Rapid Commun., Vol 8, pp. 467-471 (1987), Berneth et al. WO 98/51721, Haarer et al. DE 4431823, or Stumpe et al. DE 4339862, in view of Kawano et al. '890 and Colvin et al. '648 and further in view of Savant et al. '221 and/or Ross '663.

Savant et al. '221 teach in example IV uses dye concentrations of 4.5 to 25% in polyvinyl alcohol. Examples V describes the azo dyes bound to a polyethylene vinyl alcohol backbone and coated to a thickness of 10 microns. Examples XIII to XX describe thicknesses of 10 to 150 microns (0.1 to 0.15 mm) with dye loading concentrations of 10% as the best (23/53-55). The storage of multiple holograms in the same spot by controlling the angle between the incident (object) and reference beams is disclosed. (25/46-57 and 7/11-15). Suitable polymers are disclosed in columns 8-10. Useful azo dyes are disclosed in columns 9-17. The formation of thicknesses of 10-1000 microns by spin coating is disclosed. (18/51-66).

Ross '663 teaches holographic recording media which are 1 cm thick in the examples. In addition to the basis provided above, the examiner cites Savant et al. '221 to further support the obviousness of the use of angular multiplexing with azo dyes and Ross '663 to support the position that the use of thick holographic recording media (up to 1 cm thick) is old and well known in the art.

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5 Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J. Angebranndt
Primary Examiner
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03/15/2004